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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/523,201

01/25/2005

Gyo Muramatsu

MURAMATSU2

8346

1444 7590 10/28/2008
BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, NW
SUITE 300
WASHINGTON, DC 20001-5303

EXAMINER

PICKARD, ALISON K

ART UNIT

PAPER NUMBER

3676

MAIL DATE

DELIVERY MODE

10/28/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,201	Applicant(s) MURAMATSU ET AL.	
	Examiner Alison K. Pickard	Art Unit 3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants'

Admitted Prior Art (APA1) (Page 2, lines 11-28) in view of APA2 (page 4, lines 8-27) in view of Hannig '283.

Applicants admit that it is known to coat a piston ring with a PI or PAI material having a molybdenum disulfide dispersed therein. The solid lubricant content is also within the required range (see page 2, lines 21-22). And Applicants admit that a PI or PAI-silicon dioxide hybrid material is known and provides improved mechanical strength and heat resistance while maintaining softness and extensibility. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the piston ring coating of APA1 with the PI or PAI-silicon dioxide hybrid material of APA2 to improve the mechanical strength and other features of the coating. The combination would yield expected results and at the very least would have been obvious to try.

APA1 does not appear to disclose the particle size of the solid lubricant. Hannig teaches coatings for piston running surfaces and piston rings. The coatings are polyimide based and include solid lubricants having particle sizes between 1 and 10 microns. This range is within the claimed range. And, it is desirable to keep particles small to keep the coatings smooth. All of

Art Unit: 3676

the claimed elements are known in the prior art and one skilled in the art could have combined the elements as claimed by known method with no change and their respective function. The combination would have yielded predictable results. And the technique of using such particle sizes in similar coatings is known.

3. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onada in view of APA1 in view of APA2 in view of Hannig in view of Tanaka '162.

Onada discloses a piston ring having a nitrated layer 6 and resin binder coating comprising PAI and a solid lubricant dispersed therein. Onoda does not disclose the coating is a PAI hybrid material or (for claim 8) the claimed content of the solid lubricant. Applicants admit that it is known to coat a piston ring with a PI or PAI material using a solid lubricant content within the required range (see page 2, lines 21-22). And Applicants admit that a PI or PAI-silicon dioxide hybrid material is known and provides improved mechanical strength and heat resistance while maintaining softness and extensibility. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the piston ring coating of Onada with the lubricant content taught by APA1 and with the PI or PAI-silicon dioxide hybrid material of APA2 to improve the mechanical strength and other features of the coating. The combination would yield expected results and at the very least would have been obvious to try.

APA1 does not appear to disclose the particle size of the solid lubricant. Hannig teaches coatings for piston running surfaces and piston rings. The coatings are polyimide based and include solid lubricants having particle sizes between 1 and 10 microns. This range is within the claimed range. And, it is desirable to keep particles small to keep the coatings smooth. All of the claimed elements are known in the prior art and one skilled in the art could have combined

Art Unit: 3676

the elements as claimed by known method with no change and their respective function. The combination would have yielded predictable results. And the technique of using such particle sizes in similar coatings is known.

Onada does not appear to disclose the thickness of the nitrided layer. Tanaka teaches coatings for piston rings and includes a nitrided layer 2. Tanaka teaches the layer has a thickness of 10-90 um, which is within the claimed range. Applying a nitrided layer within the claimed thickness is a known technique within the piston coating art. Thus the claim would have been obvious because the technique for improving coatings was part of the ordinary capabilities of a person of ordinary skill in the art in view of Tanaka to when improving coatings applied on a nitrided layer.

Response to Arguments

4. Applicant's arguments filed 7-17-08 have been fully considered but they are not persuasive.

In response to Applicants' argument that there is no reason to combine the references, KSR forecloses the argument that a specific teaching, suggestion, or motivation is required to support a finding of obviousness (see KSR, 82 USPQ2d at 1396). And, the examiner has stated reasons and rationale for the combination. Applicants' APA1 (e.g. JP 62-233458) and Onada disclose a piston ring with a PI/solid lubricant coating. APA1 (JP '458) also discloses a lubricant content within the claimed range. APA2 (e.g. JP 2001-240670 or either article) discloses that PI hybrid materials are known and provide improved characteristics. The improved characteristics are motivation to at least try. And the rationale would be that the substitution of a known, equivalent element for another would yield predictable results.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 571-272-7062. The examiner can normally be reached on M-F (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Gay can be reached on 571-272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3676

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alison K. Pickard/
Primary Examiner, Art Unit 3676

AP